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REPORTS

UPON THE PROPERTY OF THE

SHAWANGUNK

Lead Mining Company.

BY

PROFESSORS SHEPHERD AND EATON,
MR. C. H. McCULLOUGH AND MR. H. KELLEY.



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New-York :

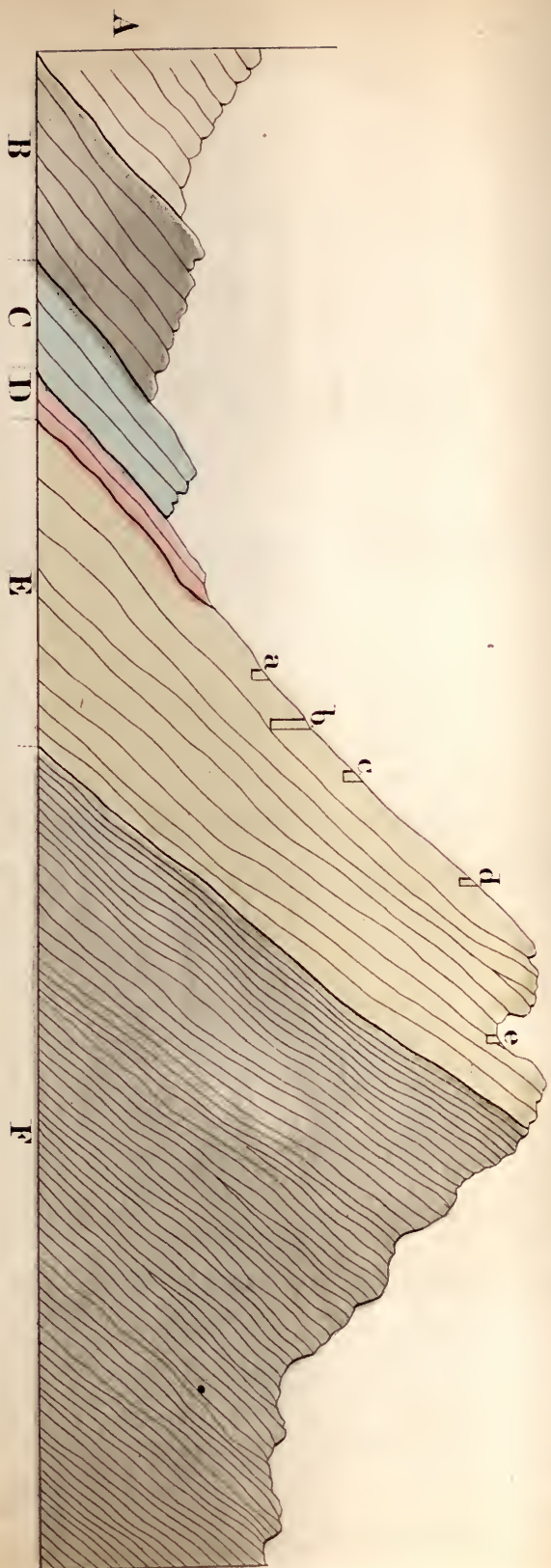
JOHN W. AMERMAN, PRINTER,
No. 47 CEDAR STREET.

1863.

SECTION OF THE SHAWANGUNK RANGE.

- A. Portage and Chemung Group.
- B. Hamilton Group.
- C. Helderberg Group.
- D. Red Grit.
- E. Shawangunk Grit.
- F. Hudson River Slates.

-
- a.* Extreme westerly opening of Hill vein.
 - b.* Main Shaft of " "
 - c.* Extreme easterly opening of " "
 - d.* Opening, showing the fissure.
 - e.* Opening of the "Shawangunk Lead Mining Company."





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THE
Shawangunk Lead Mining Co.

LOCATION OF THE PROPERTY.

~~The considerations above presented briefly~~ will commend themselves to every practical man, the Company preferring a concise exhibit of facts to a labored exposition of advantages which they consider self-evident.

REPORT OF PROF. A. K. EATON.

TO THE TRUSTEES OF THE SHAWANGUNK LEAD MINING
COMPANY :

Gentlemen,

In accordance with your desire, I have visited your mining property, lying adjacent to that known as the "Hill Mine," in the township of Mount Hope, in Orange County, and would respectfully report as follows, with regard to its relative position and prospective value. In doing so, I shall first describe, briefly, the character, position and bearings of the Hill Vein.

The Shawangunk Mountain range, in which this extraordinary deposit occurs, has been produced by the

property, as has just been stated, is on *the same line*, which increases in wealth as it advances and extends. The geological characteristics of the territory leased by the Company, are of the most encouraging nature, indicating, as the result of the most careful scientific investigations and estimates, the desirable elements of "permanency and continuity in the direction of veins."

At other points of the range the strata are irregular and eccentric; here the formation becomes uniform and decided, warranting the deductions above noted. All the indications sought for by the practical miner and the scientific geologist and chemist, as evidence of the existence of a vein of incalculable wealth, are here exhibited in combination. The specimens of ore obtained

~~of remarkable purity. The results of an analy-~~

solid, and promising a future so brilliant, upon terms so favorable.

ECONOMY IN WORKING THE MINE.

The mining operations of the Company will be conducted with far less expense than is usually involved in similar undertakings, from the nature of the property to be worked. Thus, the cost of drainage will be comparatively trifling, while other operations will be greatly facilitated, from the fact of the mine being opened at the base of an elevation nearly 200 feet in height, and at the junction of the Shawangunk grit and Hudson river slate, both highly metalliferous formations.

The considerations above presented briefly will commend themselves to every practical man, the Company preferring a concise exhibit of facts to a labored exposition of advantages which they consider self-evident.

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The Shawangunk Mountain range, in which this extraordinary deposit occurs, has been produced by the

upheaval of the strata known to geologists as the *Shawangunk grit*, which consists at the bottom of layers of conglomerate, and gradually changes to a firm grit in the upper positions.

The axis of elevation of the range strikes N. 37° E., the strata being inclined to the horizon at an angle of 51° ; the direction of the dip of the rocks being W. N. W. 53° . The conglomerate grit rises at this point to an elevation of several hundred feet. Following the range northeasterly, we find it gradually sinking, until, at a point about forty miles from this locality, it disappears beneath the water-line group. The range, heretofore, has been considered by geologists as likely to prove highly metalliferous in its character, but the veins hitherto worked for lead have been upon the lower portion of the range, and in the vicinity of dislocation of the strata produced by transverse uplifts, which have given the formation an uncertain character at these points, and greatly increased the expense and multiplied the difficulties of mining. One of the most remarkable features and most promising elements in this particular location is *the unbroken character of the range*, the promise of *permanency* and *continuity* in the direction of veins being increased thereby. This vein is remarkably large and well-defined, and the ore unusually free from gangue; so far as developed, it has exceeded the expectations of the most sanguine. Assays of several samples of the ore gave the following results:

No. 1.—Lead, 78 per cent.

Silver, (per ton of lead,) \$6 21.

No. 2.—Lead, 75 per cent.

Silver, (per ton of lead,) \$6 77.

An average of ore taken with gangue rock attached, from all parts of the vein, gave

Lead, 68.86.

Silver, (per ton of lead,) \$6 75.

The vein has been struck and ore taken out at three different places, the extreme points being 240 feet apart. This portion of the vein has a direction 80° W. N. W., but, beyond the eastern opening, the fissure bears more northerly. The occurrence, however, of what is, apparently, the original fissure, at a point more than five hundred feet higher up upon the mountain side, indicates that it has regained its original general direction. Following this line to the top of the range, we strike the McBride farm, now owned by your Company, upon which excavations have been made in search of the continuation of the vein. The depth to which they have been carried is not sufficient to strike the rocks in place. Large masses of the grit were encountered, and doubtless the rock is not far below. The indications of proximity to a vein were as strong as they could well be, viz., lumps of pure ore imbedded in yellow clay.

In this statement I speak from information. At the time of my visit the openings were partially filled with snow, which precluded the possibility of any minute examination. I consider your lands as prospectively highly valuable, needing only proper development to demonstrate its actual value.

It will fully warrant the prudent use of capital in such demonstration.

A. K. EATON, *Geologist and Chemist.*

Dated, 161 Broadway, N. Y., March 28th, 1863.

New-York, March 25th, 1863.

MR. C. W. POLLARD :

Dear Sir,—At your request I visited, last week, the property leased by you, and designated as the Shawangunk Lead Mining Company's land, and have to make the following report :

I commenced at the shaft first sunk by the Erie Lead Mining Company, and followed the course of the vein up the mountain, observing minutely the dip of the lode, and find its course as follows, W. N. W. 53° .

I found out-croppings all along the course of the vein to the Shawangunk Company's property ; at this point, situated at the base of an abrupt elevation, the Company have made an excavation of about twelve feet in depth, at the point where the compasses indicated, by the use of flags along the great vein below it would naturally be found ; here was found the same surface indications as on the Erie, small lead boulders intermixed in the sandstone grit, accompanied with clay and gossion, proving conclusively, to my mind, that there must be a rich vein below. My reasons for forming this opinion are as follows :

First.—From its contiguity to the Erie Company's Mine, the property being within twenty-five rods of theirs, and their vein growing wider and stronger as they proceed up the hill.

Second.—The boulders all being rounded, prove that the great mass, or deposit, must be found higher up the hill.

And thirdly, That, as they have on your property all the surface indications, and nothing but metalliferous

rocks and clay in its vicinity, you must be near a great mineral deposit. Trusting that a very short time will develop the fact that the Company have an inexhaustible fund of wealth,

I am, Sir,

Your most obd't,

CHAS. H. McCULLOUGH.

New-York, March 30th, 1863.

A. R. FULLERTON, Esq. :

Dear Sir,—In regard to your inquiries about the Shawangunk Mining Company, I would state, that I have visited the location, and believe the prospects of the mine are good. It adjoins the Erie Company's property, and the vein has been cut on their property within a hundred feet of the Shawangunk property, and I have cut lead on the Company's property at the depth of twelve feet from the surface, weighing from eight pounds down to one-quarter pounds, precisely like that struck on the Erie Company's property; and the indications are fully as good on the Shawangunk Company's property as they were on the Erie, and I see no good reason why they should not have just as good a mine when they have spent a little money.

Your obedient servt.,

H. KELLEY.

C. W. POLLARD, Esq. :

Respected and Dear Sir,—Agreeable to your request, I have visited and examined the landed estate of Ira

McBride, Esq., in the township of Mount Hope, Orange County, State of New-York, with especial reference to the existence of mineral deposits upon said property. Said estate is situated on Shawangunk Mountain, covering a good portion of its northwestern slope, then rising so as to include its lofty summit, and extends thence southeasterly to its base, including in its area a large farm, the boundaries of which were pointed out to me by Mr. McBride.

A portion of the tract on the northwest adjoins the celebrated mineral property which contains the great lead vein, a short time since discovered on the Erie Rail-Road, (and recently purchased by the Erie Lead Mining Company,) while the remainder of the McBride tract is in a favorable position to receive and embody the rich veins that traverse the property of the Erie Company, and are traced upward and onward into the body of the mountain towards the land of Mr. McBride.

As a snow-storm was raging, and a dense fog, at times, obstructed the sight, I found it difficult to run the line of the great Erie vein with accuracy; consequently, I must refer you to the line pointed out to me by Mr. McBride, as carefully given, recently, by Prof. Eaton, which would make the vein, if extended, cut the McBride farm nearly in the middle, and run within a few feet of the excavation upon said farm, in which I understood Colonel Kelley to say, that he not only found the distinct marks of the vein, but also boulders of the lead itself in a vertical fissure, accompanied by gossan and uncleaned clay, which are considered by experienced miners as infallible signs of a rich deposit of lead.

Here, then, are presented to us similar and equally strong surface indications of a large lead vein upon this

property as at first existed on the estate of the Erie Lead Company, which, by the judicious expenditure of limited capital, have given rise to a development of mineral wealth truly astonishing.

Some may suppose that because the lead on the Erie estate is found in sandstone or hard millstone grit, it will not be found in the limestone or slate adjacent. This by no means follows, for lead is common to all these rocks, and, as a general thing, is found more abundant in both the limestone and the slate than in the sand or grit-rock. Should the great Erie vein enter the slates that occupy the southeastern portion of the McBride tract, the amount of lead will probably be increased in it, and the vein, if possible, become more persistent and reliable.

To show that the same chemical action, in a like manner, pervades the whole mountain, I find, in proof thereof, the same kind of chalybeate mineral springs issuing from both sides at the base. As to the character, strength and persistence of the great Erie vein, I beg leave, in conclusion, to refer to the able report of Thomas Petherick, Esq., a geologist and miner of high repute, as said report appears in the New-York *Tribune* of April 8, 1863. In this report, Mr. Petherick represents it as a true vein, from two to nine feet in thickness, cutting boldly through the hard grit rocks in a masterly manner, as before remarked, upward and onward towards the McBride property, where were discovered the boulders of lead with the clay and gossion.

Respectfully submitted,

By your obd't servant,

FORREST SHEPHERD.

New-Haven, April 9, 1863.

REPORT OF THOS. PETHERICK, ESQ.

When the Erie Rail-Road was being built through the hills near Port Jervis, the workmen cut across a metallic vein, little suspecting they had uncovered the richest lead-bearing lode ever discovered in this country, and perhaps any other. Recently, some New-York capitalists have bought the location, organized a company for working it, under the title of the Erie Lead Mining Company, and are now delivering large amounts of lead with as much regularity as the best developed mines of Europe. Mr. Thomas Petherick, the well-known mining engineer, has visited this mine within a few days, and writes to a friend as follows:

The vein varies in size from about two feet to over nine feet in width, and is nearly perpendicular. It is a true vein, making its way through the hard sandstone rock of the country, which, to use a familiar mining expression, "it masters." Its appearance, composition, and characteristics are such, in my estimation, as to justify great confidence in the successful and important results of extended operations.

This shaft is about 32 feet deep, and has been sunk, in rich lead ore, from the very surface. In the bottom of the shaft, the vein is over 9 feet wide. On its south wall there is a very rich "leader" of ore, with scarcely any admixture, (and the little there is of the matrix in it is of a very favorable nature as a symptom,) varying from 20 inches to 2 feet in width. The other part of the vein has also a favorable appearance, the great-

est part of it containing a considerable proportion of galena, and its frequent accompaniment in productive mines, "blende," or sulphuret of zinc. With suitable machinery for reduction and separation, this part of the vein can be worked with great advantage. The walls of the vein are well defined and regular, and on the north wall there is a good looking "flookan," or clayey course, very important in regard to the facility of mining, and still more so as a favorable characteristic. Altogether the appearance of the vein in this, the deepest opening, is, in my opinion, most satisfactory, both as to present productiveness and the future prospect.

Nearly 85 feet from the shaft, there is a drift, (about three feet higher than the top of the shaft,) which has been extended easterly about 64 feet beyond the open cut. In the west part of, and outside the close drift, very little below the surface, there is a course of galena, about 50 feet in length; in the greatest part of which it was three to four feet wide, and at one point about five feet. I anticipate important results from the extension of a level at a proper depth. In extending the drift easterly, for some yards, the vein, though of a promising appearance, had not been productive. When I first saw it, it was small, about 20 inches wide on the face of the drift, of a favorable character, but with little, if any, ore; but on examining it subsequently, I found the vein considerably larger, being two feet nine inches wide, of very promising appearance, and containing some galena and blende—the latter a good indication of further improvement.

There is also a trial pit, stated to be 12 feet deep, in which I am informed there is a good sized, promising vein, but it was not accessible for my examination.

Beside the ore already sent to market, and on the ground ready, or being prepared for it, there are considerable quantities of second class and of inferior ore, lying on the surface; but from there being a great deal of snow on the ground, I could not well ascertain the quantity of ultimately available ore thus far mined. I apprehend, however, that it is from 100 to 110 tons of the first-class description, and that including the ore remaining on the ground, (to be reduced and prepared by machinery,) the whole quantity mined to this time will exceed 160 tons, the value of which, at the present market price of lead, I estimate at about \$20,000, at the mines. I am not aware what the actual costs have been, nor is that material, because the commencement of mining proceedings generally is attended with extraordinary expenses, much beyond the ordinary expense of a settled regular management. I consider that under such management the proportion of profit on its production would very soon be unusually large for the most prosperous mines, say over 80 per cent. I wish to guard against any misapprehension arising from this observation, by remarking, that this great rate of profit cannot be expected to be long maintained, notwithstanding that a great increase in the aggregate profit may be reasonably expected to progress for a long time; for as the mine openings extend in different directions, it may be expected that in addition to such rich courses of ore as those reached by the present openings, large additional quantities of less rich vein stuff, mixed with the gangue, will, by the application of suitable machinery for their reduction and separation, be very profitably operated on, and largely increase the aggregate amount of profit.

Mr. Petherick winds up by saying :

Before closing this letter, I will observe that I have never in my experience seen any mine, in which, looking to the extent of the development effected, afforded greater, if so great, a prospect of large and increasing profits.